Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

[redacted]

STAT

15 June 1967

MEMORANDUM FOR THE RECORD:

SUBJECT: Evaluation of the [redacted] Advanced Light Table with Translating Microscope Carriage

STAT

1. The Measuring Accuracy. Over the period 17-19 May 1967 the accuracy of the subject light table was determined. The following is a summary of those results:

a. Evaluator: [redacted]

b. Test Grid: [redacted]

c. Microscope: [redacted] Zoom 70

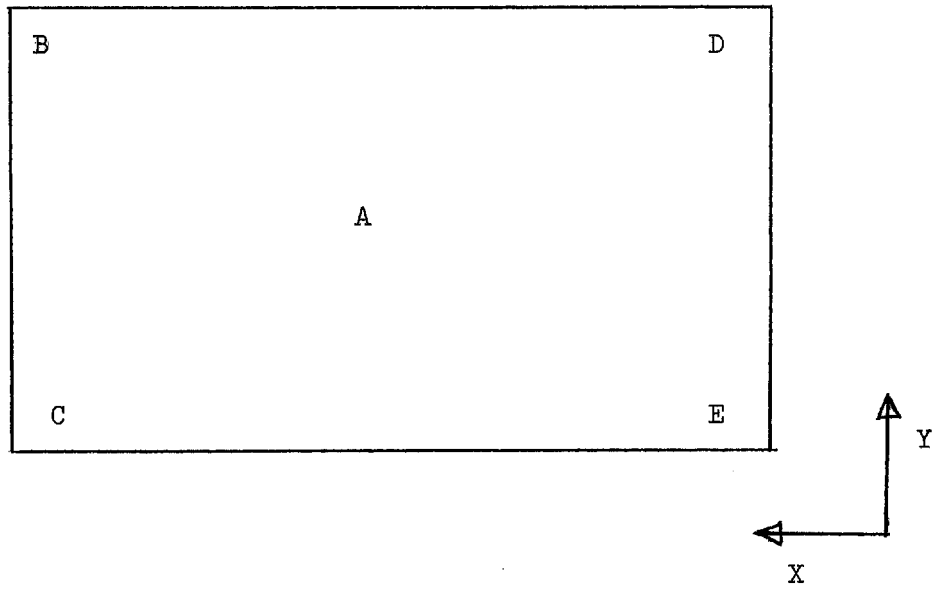
STAT

STAT

d. Microscope Magnification: 30X

e. Expansion of test grid: assuming a thermal coefficient of expansion of 5 (10^{-6}) in/in/°F and knowing that the grid was calibrated at 68°F, one can determine that the bar expands 1µ/5mm when the light table is operated at 108°F for $\Delta t = 108 - 68 = 40°F$

$\Delta L = 5(10^{-6})/°F\ (40°F)\ (50\ mm) = 10\ \mu/50\ mm = 1\ \mu/5\ mm$



Declass Review by NIMA / DoD

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

The specific data listed represents a statistical analysis of the measuring accuracy of the light table. The tables show measurements made at each of the five positions (A through E) as indicated on the above diagram. The [redacted] calibrated scale was used for each measurement and the grid positions at which measurement checks were made are indicated in the first column. The raw data indicating the micron readings taken is shown in the columns labeled A. Column B shows this data corrected for the thermal expansion of the scale. Then in Position A, "X" corrected motion (Column B of that table) the indicated error between the scale's grid position one and two is one micron and the overall indicated error between zero and forty microns is five microns.

STAT

The data listed below represents a statistical coverage of at least five readings for each point and the two listings for each axis represents a multitude of attempts to obtain an acceptable calibration. The results as shown do not lead to any direct conclusion. In only one case--the second X listing at position D--can it be said that the contractual specification was met. The general trend was for the X motion to indicate a measurement longer than the true value and the Y motion a shorter value than the true length. Because of the financial condition of this contract--the contractor does not have any remaining funds in this C.P.A.F. contract--and because the translating microscope carriage developed under the parallel [redacted] contract is far superior to this concept, it is recommended that no additional monies be appropriated to remedy this deficiency.

STAT

2. The Film Transport. The film transport developed under this program has three modes of operation--manual, power assisted, and fully powered. The following chart lists the operational deficiencies:

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

POSITION A TEMP = 106.5°F

GRID POSITON (MM)	X MOTION (μ) 1515 - 1525		X MOTION (μ) 1603 - 1619		Y MOTION (μ) 1520-1537		Y MOTION (μ) 0820 - 0845	
	A	B	A	B	A	B	A	B
0	94	94	111	111	262	262	247	247
1	94	94	111	111	261	261	246	246
2	95	95	111	111	264	264	246	246
3	95	95	110	109	263	263	246	246
4	96	95	109	108	264	263	248	247
5	96	95	110	109	263	262	259	258
6	95	94	110	109	263	262	235	234
7	95	94	109	108	258	257	245	244
8	95	93	109	107	262	260	252	249
9	94	92	109	107	262	260	256	254
10	93	91	108	106	263	261	256	254
20	98	94	108	104	245	241	250	246
30	101	95	112	106	236	230	248	242
40	100	92	111	103	258	250	244	236
50	109	99	117	107	250	240	245	235
0	100	100	109	109	260	260	255	255

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

POSITION B TEMP. = 104.5°F

GRID POSITION (MM)	X MOTION (μ) 0910 - 0931		X MOTION (μ) 0934 - 0944		Y MOTION (μ) 1508 - 1521		Y MOTION (μ) 1526 - 1537	
	A	B	A	B	A	B	A	B
0	181	181	185	185	233	233	234	234
1	181	181	191	191	235	235	234	234
2	181	181	191	191	236	236	235	235
3	180	180	191	191	235	235	235	235
4	180	179	191	190	236	235	236	235
5	180	179	191	190	237	236	235	234
6	181	180	191	190	237	236	237	236
7	182	181	190	189	236	235	236	235
8	185	183	189	187	236	234	234	232
9	185	183	190	188	235	233	237	235
10	185	183	190	188	235	233	237	235
20	195	191	195	191	239	235	239	235
30	201	195	200	194	234	228	242	236
40	206	198	205	197	235	227	239	231
50	214	204	214	204	232	222	234	224
0	185	185	185	185	232	232	241	241

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

POSITION C TEMPERATURE 101.5°F

GRID POSITION (MM)	X MOTION (μ) 0954 - 1010		X MOTION (μ) 1014 - 1030		Y MOTION (μ) 0922 - 0952		Y MOTION (μ) 0957 - 1011	
	A	B	A	B	A	B	A	B
0	141	141	140	140	385	385	380	380
1	138	138	141	141	381	381	386	386
2	138	138	143	143	380	380	385	385
3	139	139	143	142	377	376	383	382
4	141	140	145	144	374	373	382	381
5	142	141	146	145	377	376	380	379
6	142	141	145	144	375	374	377	376
7	144	142	144	143	375	374	379	378
8	146	144	143	141	373	371	378	376
9	147	145	144	142	371	369	378	376
10	148	146	143	141	372	370	378	376
20	154	150	150	146	381	377	377	373
30	162	156	161	155	373	367	375	369
40	175	167	171	163	371	363	371	365
50	186	176	185	175	370	360	368	358
0	140	140	139	139	380	380	377	377

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

POSIITON D TEMPERATURE = 103°F

GRID POSITION (MM)	X MOTION (μ) 1055 - 1110		X MOTION (μ) 1113 - 1123		Y MOTION (μ) 1250 - 1306		Y MOTION (μ) 1450 - 1502	
	A	B	A	B	A	B	A	B
0	91	91	90	90	193	193	199	199
1	91	91	90	90	195	195	203	203
2	91	91	90	90	200	200	206	206
3	91	90	90	89	195	194	198	197
4	91	90	90	89	195	194	198	197
5	91	90	90	89	195	194	197	196
6	93	92	91	90	197	196	198	197
7	93	92	91	90	196	195	197	196
8	91	89	92	90	196	194	198	196
9	93	91	92	90	197	195	199	197
10	92	90	92	90	197	195	200	198
20	93	89	93	89	198	194	198	194
30	97	93	98	92	201	195	200	194
40	104	96	101	93	201	199	206	198
50	104	94	101	91	215	205	211	201
0	90	90	90	90	193	193	199	199

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

POSITION E TEMPERATURE = 104°F

GRID POSITION (MM)	X MOTION (μ) 1218 - 1235		X MOTION (μ) 1236 - 1248		Y MOTION (μ) 1020 - 1053		Y MOTION (μ) 1111 - 1126	
	A	B	A	B	A	B	A	B
0	191	191	200	200	405	405	166	166
1	194	194	202	202	405	405	165	165
2	196	196	203	203	404	404	165	165
3	196	195	203	202	405	404	165	164
4	198	197	204	203	403	402	165	164
5	199	198	206	205	401	400	165	164
6	202	202	206	205	401	400	165	164
7	201	200	208	208	401	399	166	165
8	201	198	209	207	400	397	166	164
9	204	202	209	207	399	397	166	164
10	204	202	208	206	401	399	165	163
20	208	204	214	210	399	395	165	161
30	215	209	222	216	398	392	164	158
40	219	211	224	216	391	383	161	153
50	224	214	228	218	382	372	154	144
0	200	200	203	203	394	394	162	162

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

A - READING B - CORRECTED READING (FOR TEMPERATURE)

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

A. Operation in the left mode (left handwheel turns front spool in independent mode and both spools in coupled modes.)

Film Operating	Transport Mode	Speed	Comments
Front Spool	Manual	Fast	O.K.
" "	Manual	Slow	O.K.
" "	Power Assist	Slow	Should be smoother transport at high revolutions
" "	Power Assist	Fast	Should be smoother transport at low revolutions
" "	Full Power	Fast	O.K.
" "	Full Power	Slow	O.K.
Rear Spool	Manual	Fast	Doesn't transport properly from L. to R. (slips)
" "	Manual	Slow	Doesn't transport properly from L. to R. (slips)
" "	Power Assist	Slow	Doesn't transport properly from L. to R. (slips)
" "	Power Assist	Fast	Doesn't transport properly from L. to R. (slips)
" "	Full Power	Fast	Doesn't transport properly from L. to R. (slips)
" "	Full Power	Slow	O.K.
Both Spools (Opposite Direction)	Manual	Slow	Clicking sound (W&W/O transport movement)
" "	Manual	Fast	Clicking sound (W&W/O transport movement)
" "	Power Assist	Fast	O.K.
" "	Power Assist	Slow	Should be smoother and more sensitive at high revolution
" "	Full Power	Slow	Rear film doesn't wind onto full spool L. to R. Transports onto full spool too slowly
" "	Full Power	Fast	Rear film doesn't wind onto full spool L. to R. Transports onto full spool too slowly
Both Spools (same direction)	Manual	Fast	O.K.
Both Spools (same direction)	Manual	Slow	O.K.
" "	Power Assist	Slow	Clicking sound upon rotation of handwheel
" "	Power Assist	Fast	O.K.
" "	Full Power	Fast	Will not transport onto full spools
" "	Full Power	Slow	Rear spool especially slow when going onto full spool

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

B. Operation in the right mode

Film Operating	Transport Mode	Speed	Comments
Both Spools (same direction)	Full Power	Slow	Front spool especially slow but both too slow
Both Spools (same direction)	Full Power	Fast	Doesn't transport in either direction
" "	Power Assist	Fast	O.K.
" "	Power Assist	Slow	O.K.
" "	Manual	Slow	O.K.
" "	Manual	Fast	O.K.
Both Spools (opposite direction)	Manual	Fast	Handwheel will not rotate counter clockwise
" "	Manual	Slow	Handwheel will not rotate counter clockwise and clicking sound present
" "	Power Assist	Slow	O.K.
" "	Power Assist	Fast	Handwheel will not rotate counter clockwise
" "	Full Power	Fast	Won't transport properly onto full spools
" "	Full Power	Slow	Won't transport properly onto full spools
INDIVIDUAL NOT INTENDED TO OPERATE IN THIS MODE			

In addition the transport is much too noisy in the power assisted and full power modes. From this analysis it can be seen that additional work needs to be done to improve this transport system; however, because a superior system is being developed for the [redacted] Stereoscope Light Table it is recommended that additional funds not be approved for an additional effort on this concept. The new transport will be both simpler in operation and cheaper in cost.

STAT

3. The Light Source. The light source is satisfactory except for the slight transformer buzz. This component was purchased [redacted] and this buzzing characteristic is typical of the [redacted] light source. Because of the successful light source development work performed in the parallel [redacted] contract it is recommended that no additional effort be undertaken to correct this deficiency.

STAT
STAT
STAT
STAT

4. Although not contractually required to accommodate the Wide-Span Rhomboid any future development or production versions should make provision for this instrument. To provide for this instrument on the existing light table would require a redesign of the microscope transport.

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

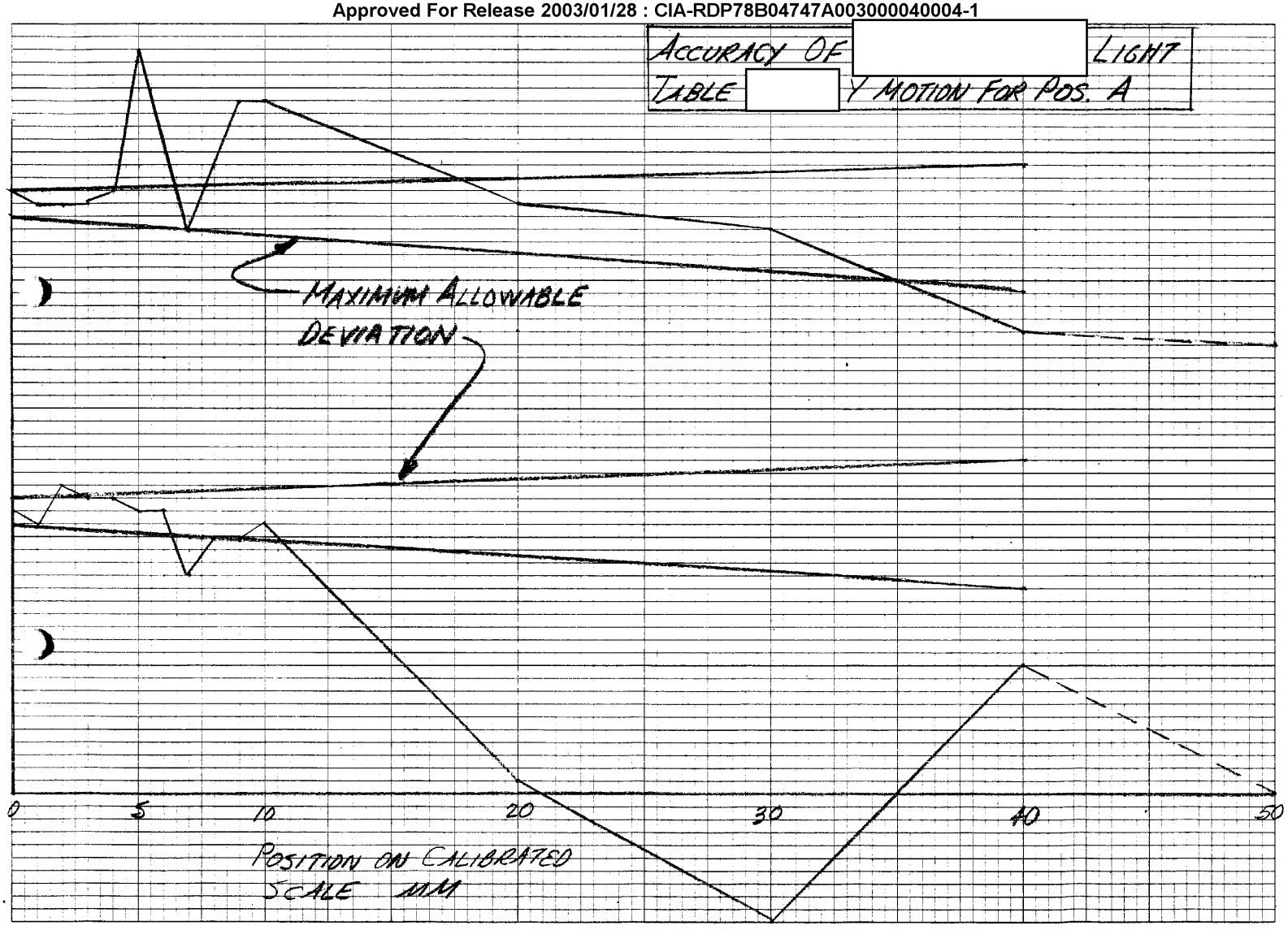
Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

5. Although this report is primarily concerned with the deficiencies found in this light table, certain features can be pointed out which should be considered superior to previous developments. Included in this category are the light masking shades, the film reel holders, the general physical configuration including the location of the controls (except for the excess weight), the implementation of the automatically actuated cover glass (except for the excessive noise in raising and lowering), and the overall workmanship.

STAT

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

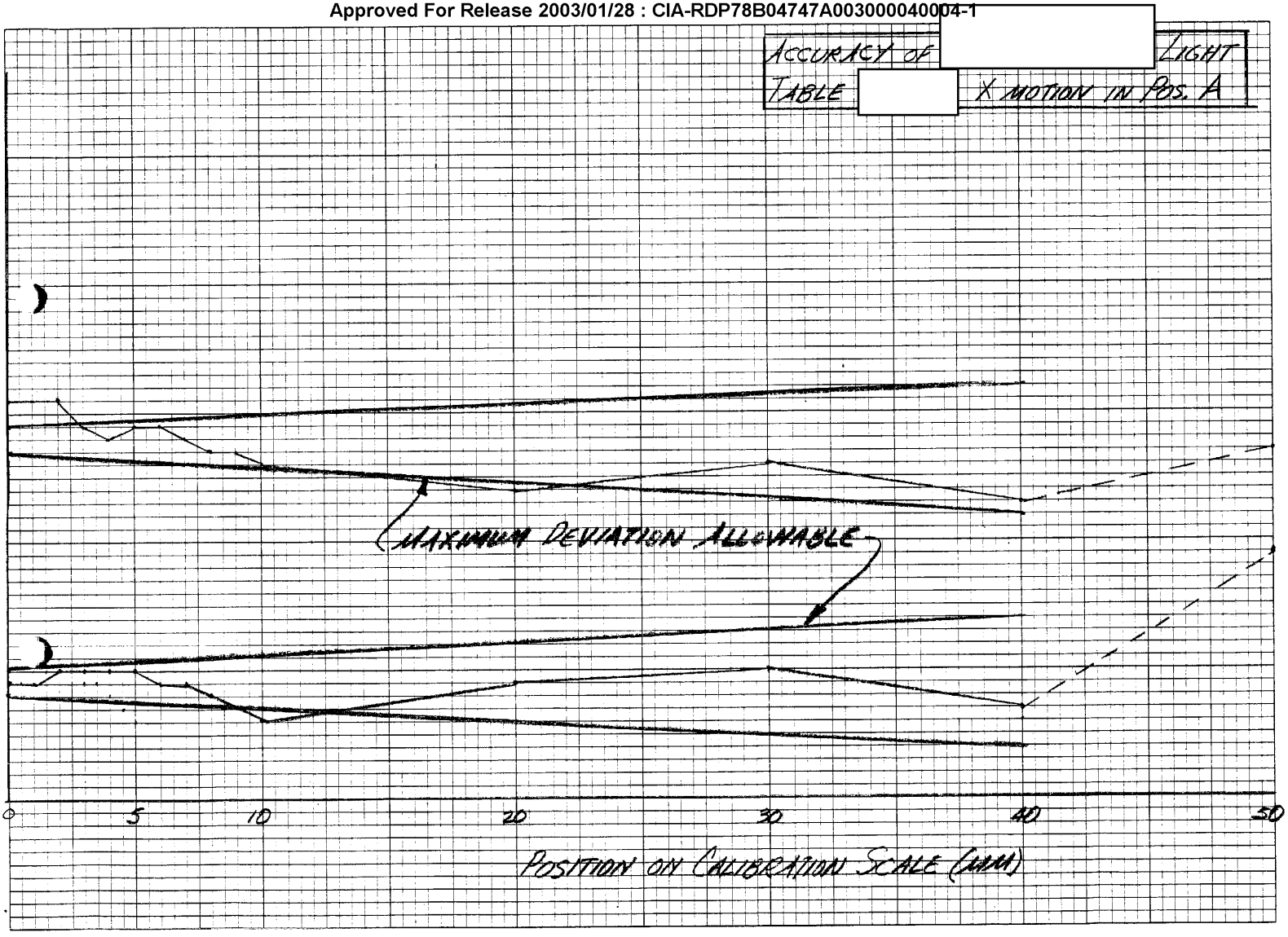
Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

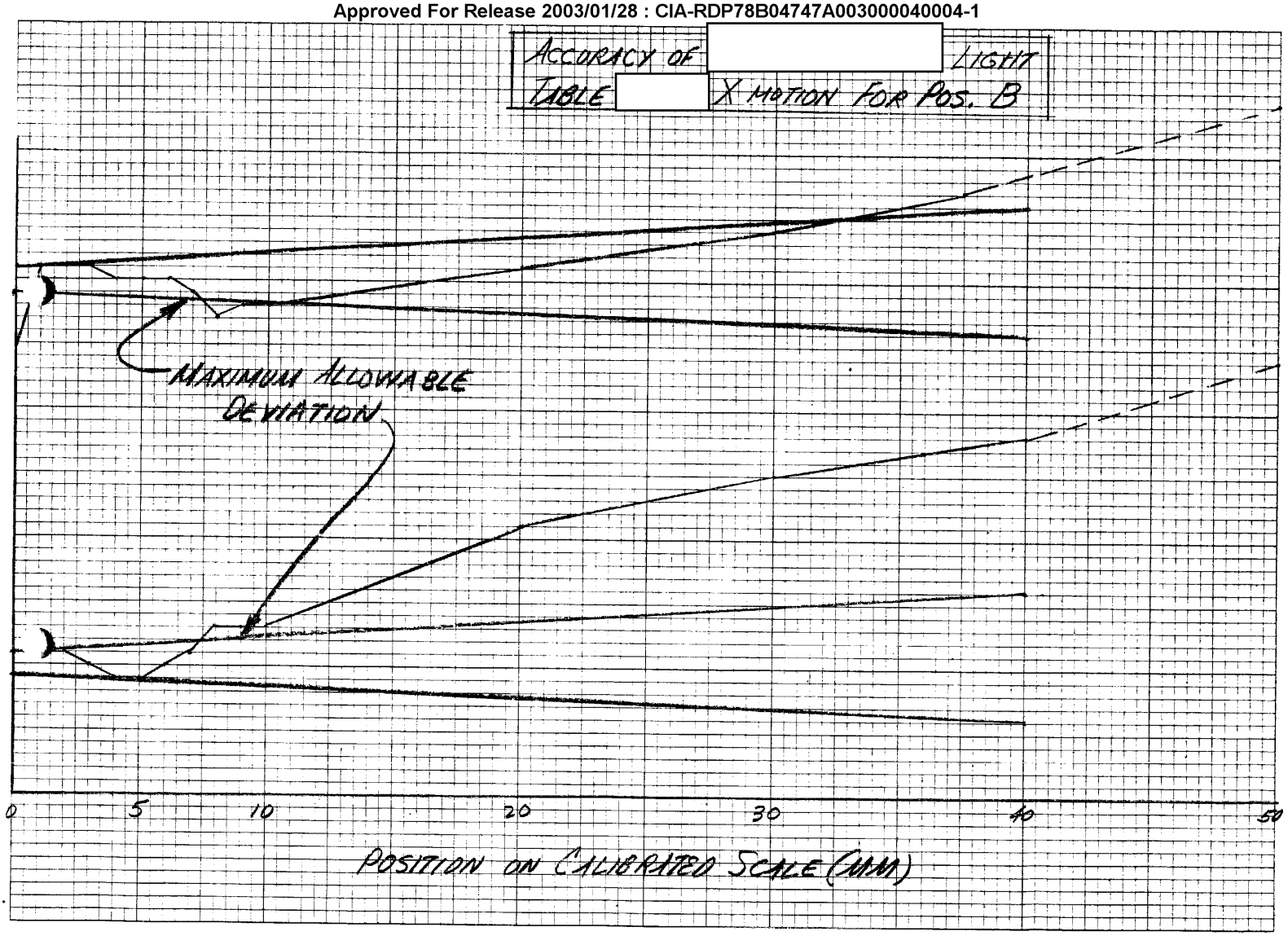
STAT STAT



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

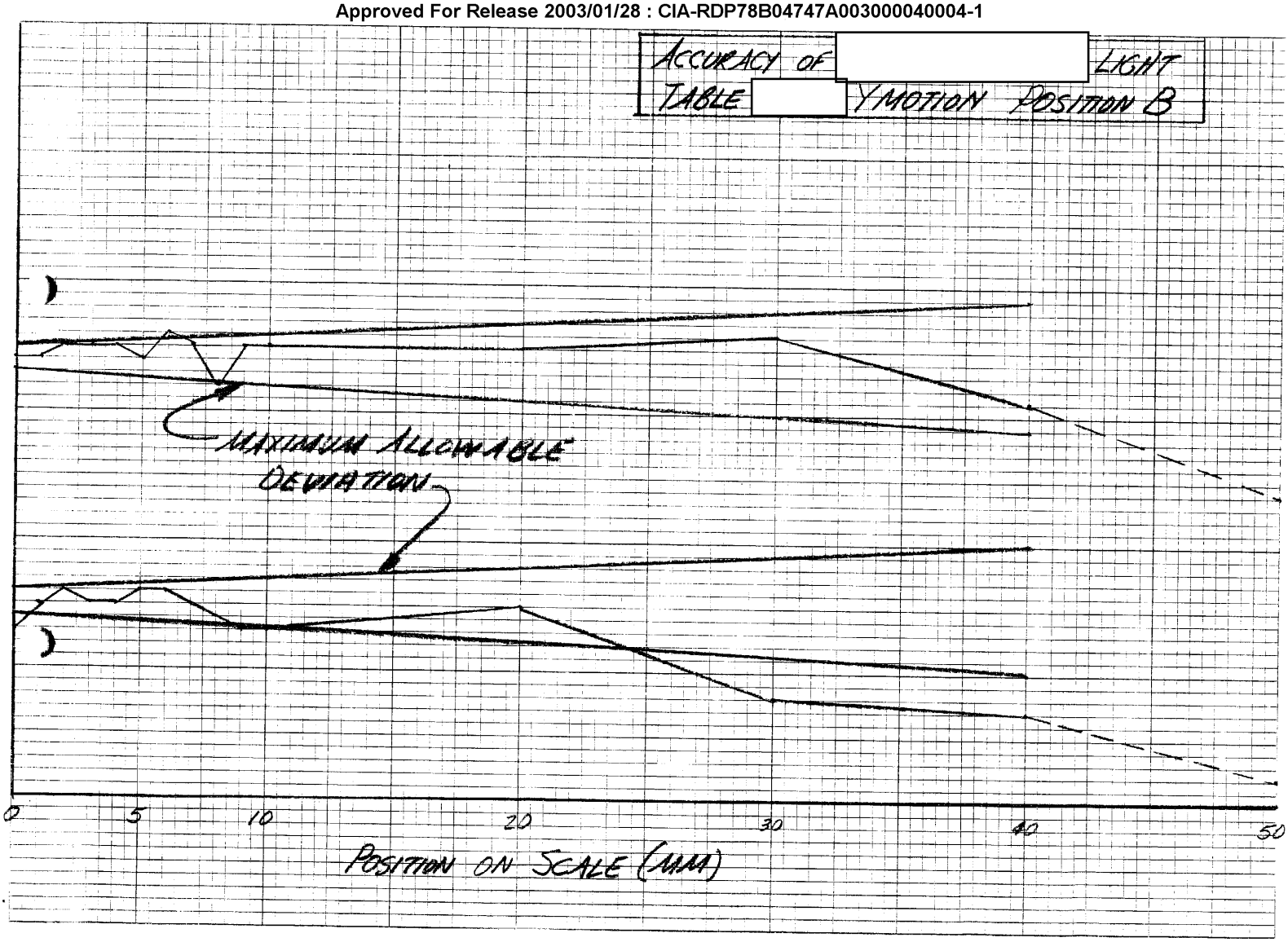
STAT STAT



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

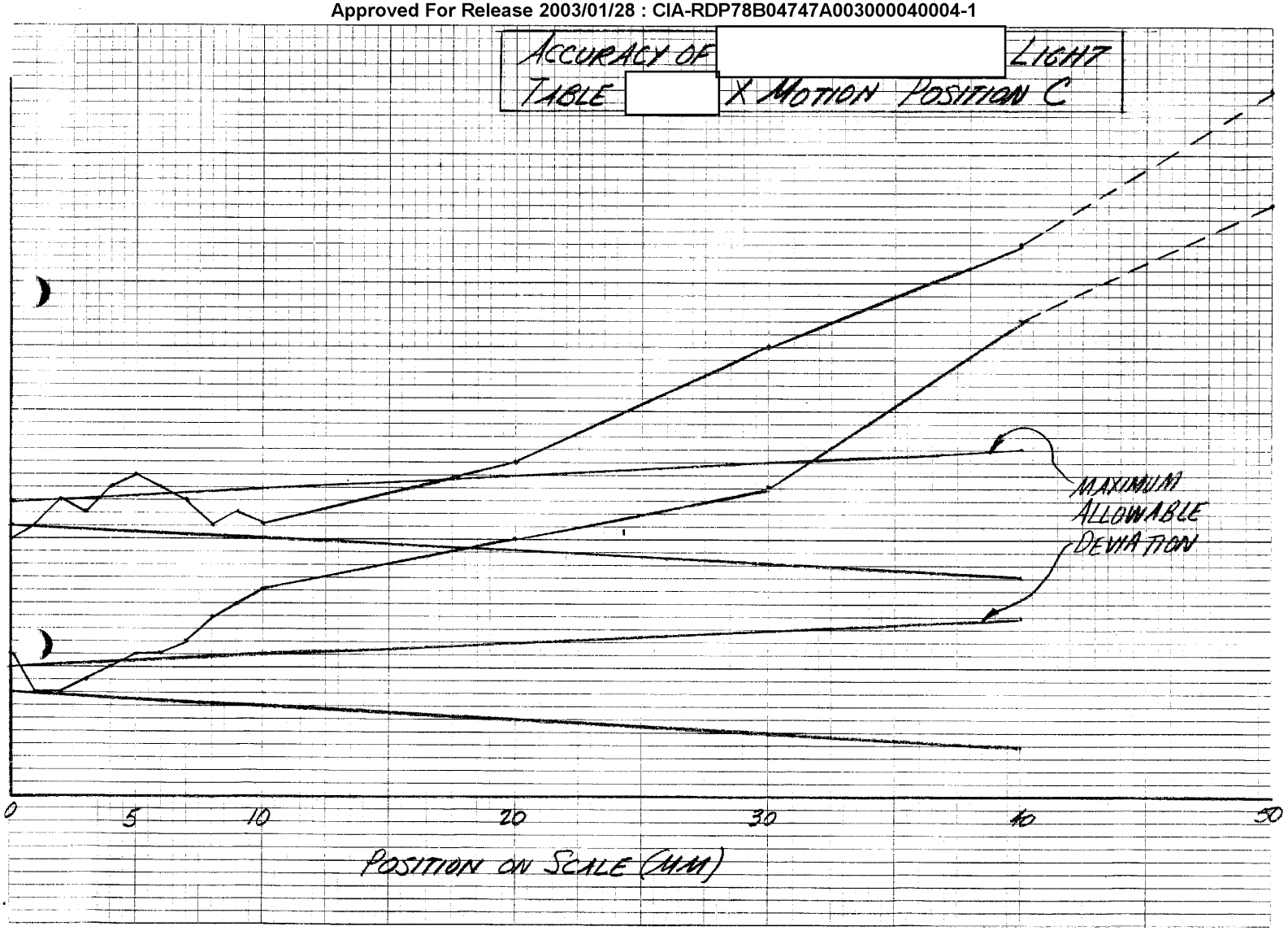
STAT STAT

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

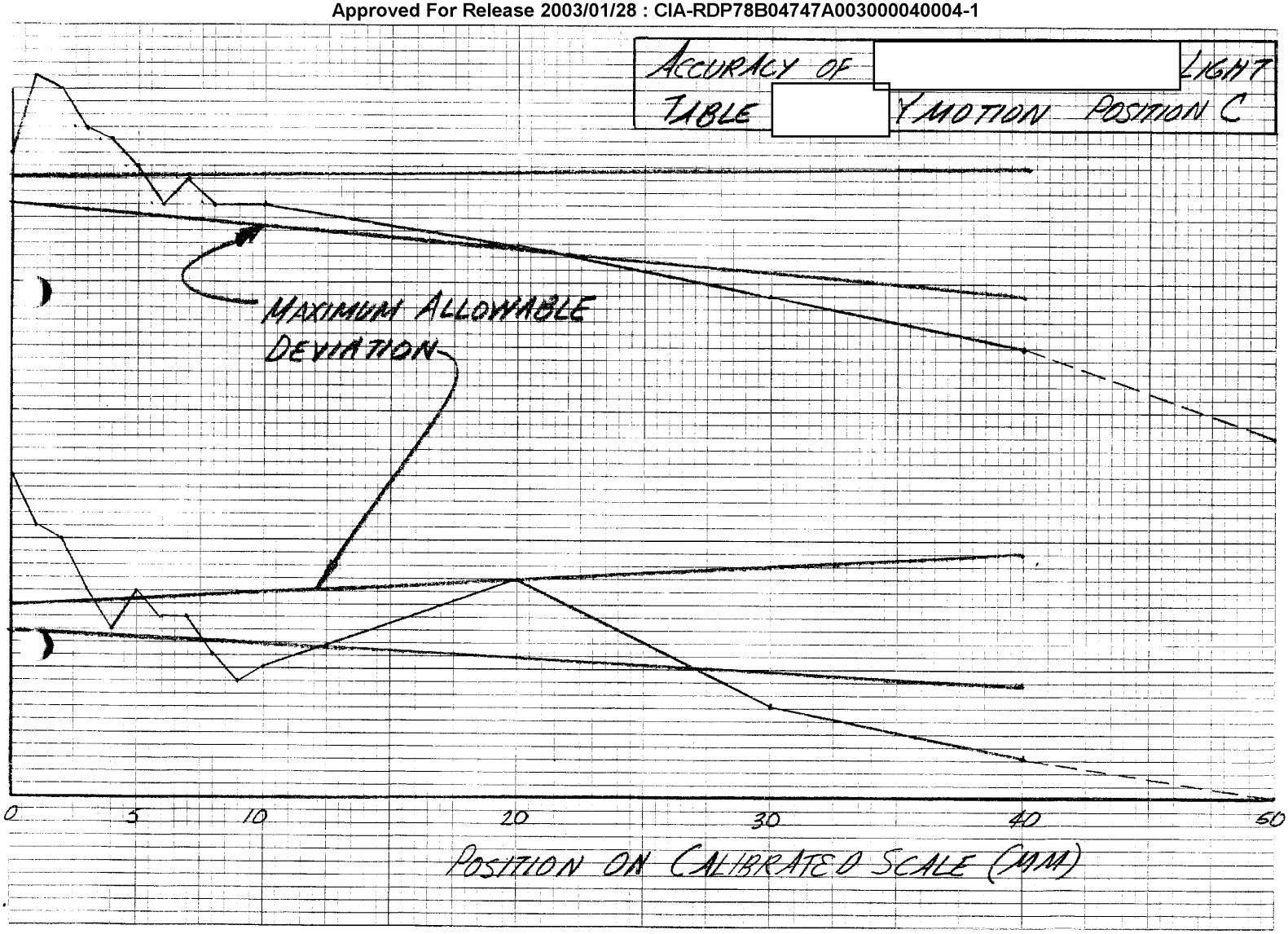
Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

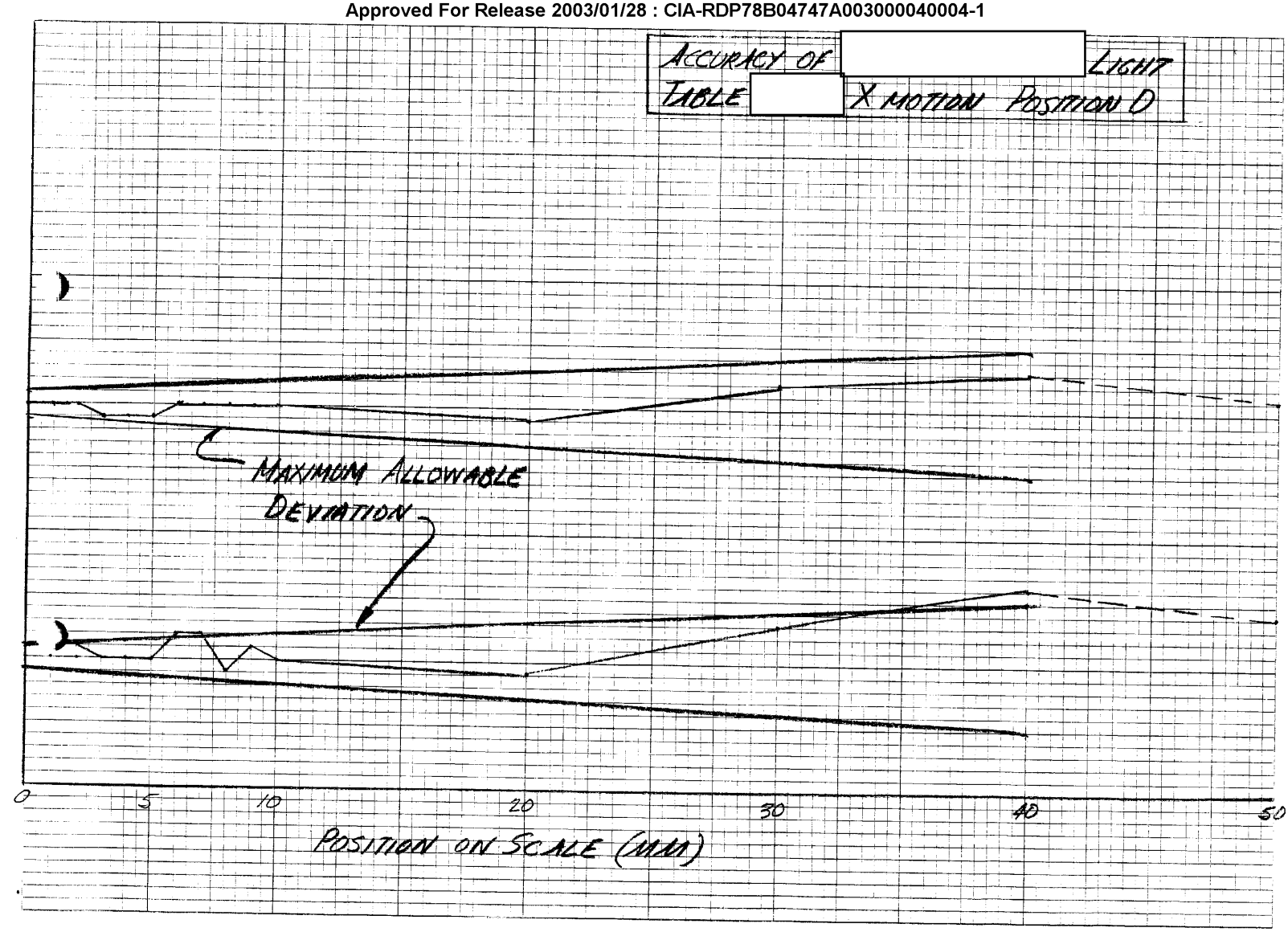
STAT STAT



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

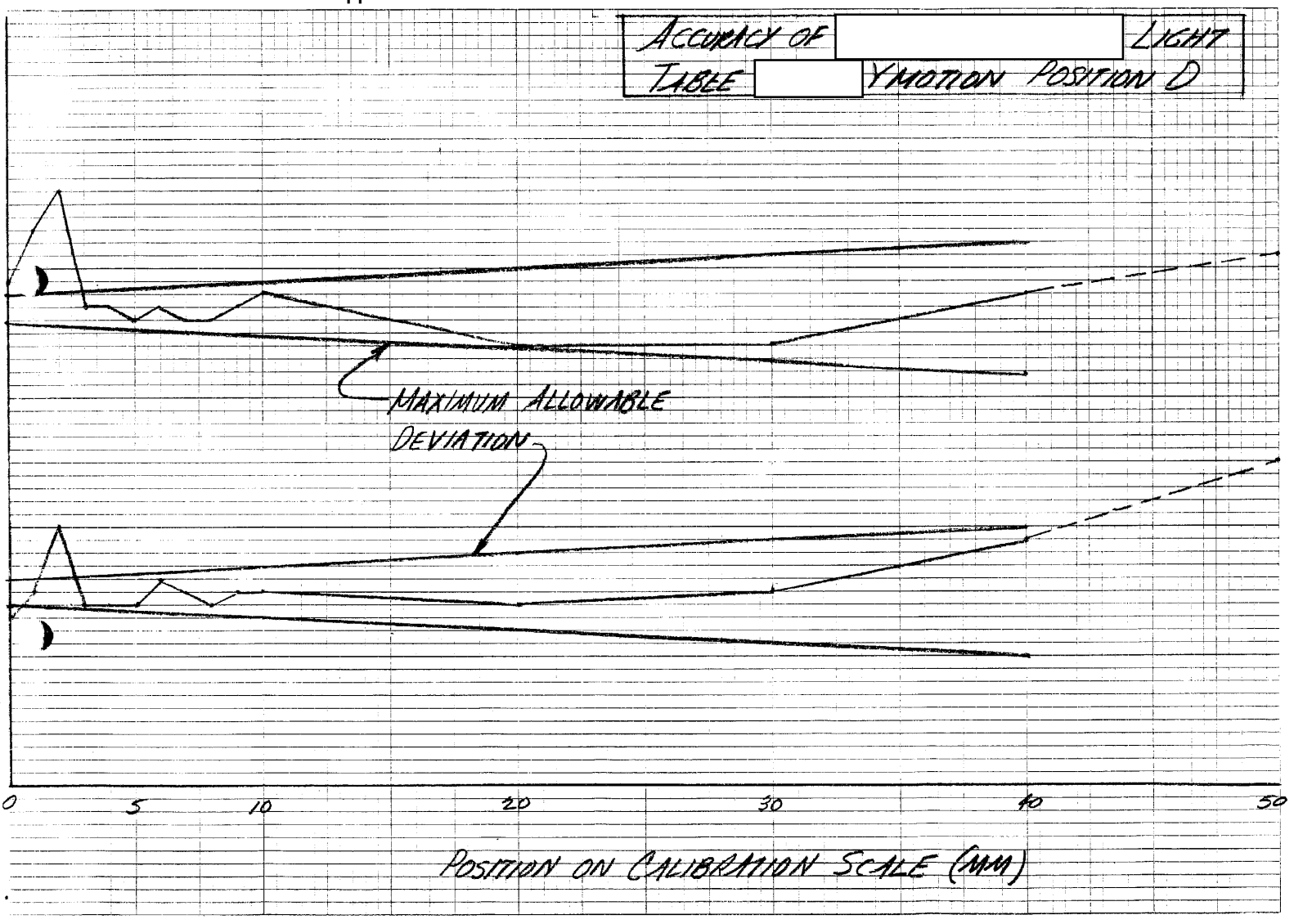
STAT STAT

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



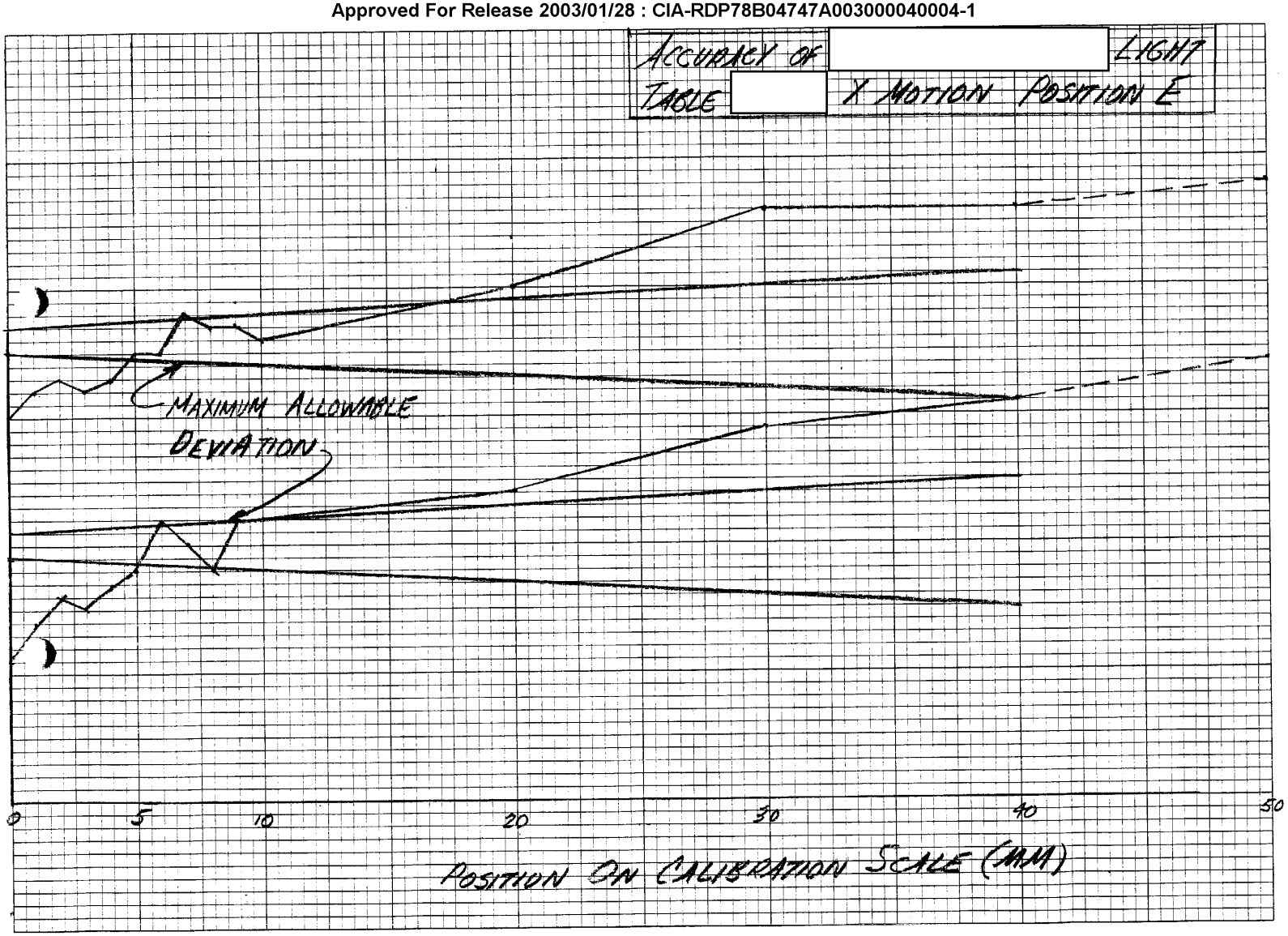
Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

STAT STAT
Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

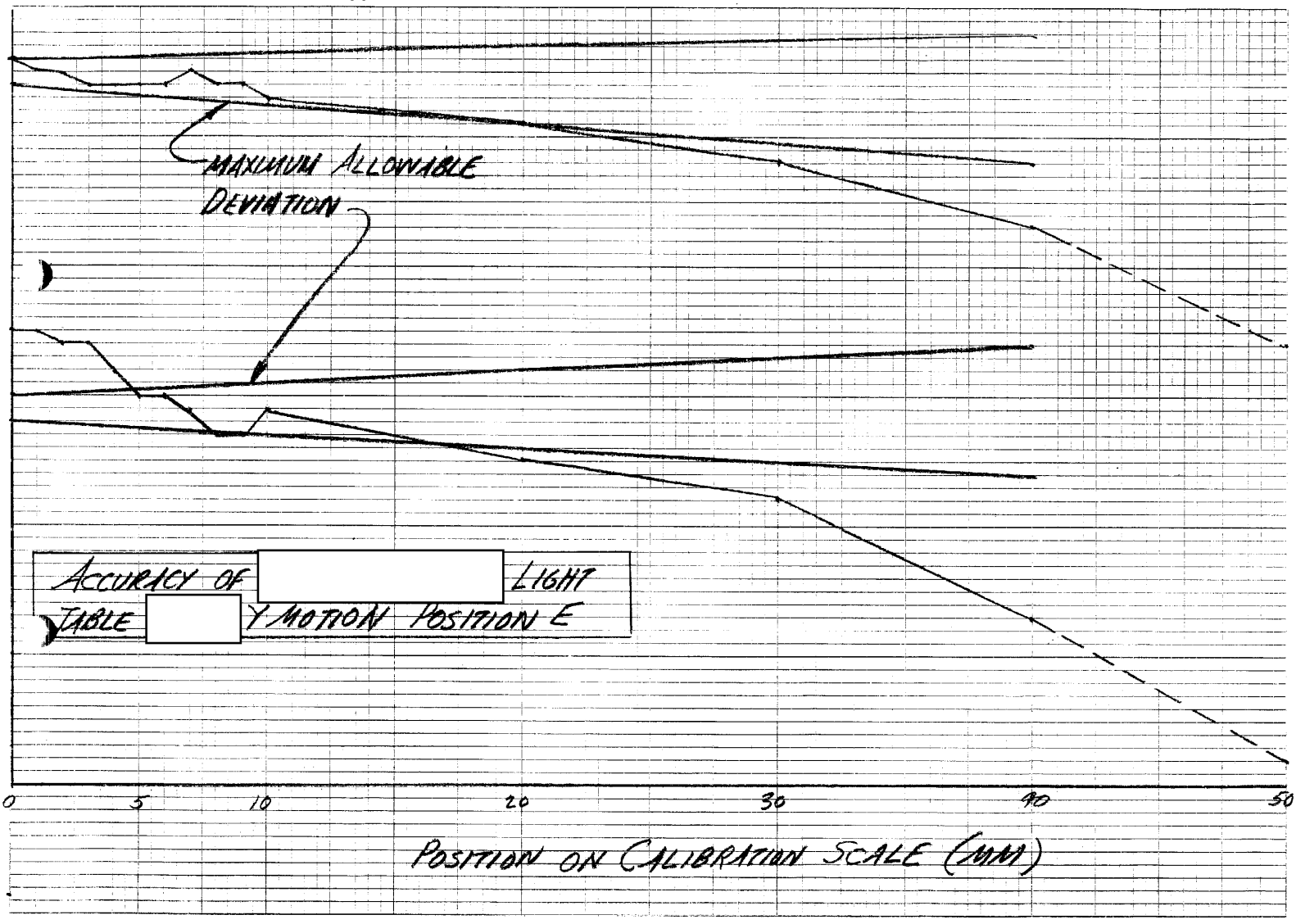
Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1

STAT STAT

Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1



Approved For Release 2003/01/28 : CIA-RDP78B04747A003000040004-1